Space Weather Forecast

Issued on Saturday, 14 January 2023 at 00:49 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate flares (R1-R2 radio blackouts) expected. Slight chance of Strong flares (R3 radio blackouts).

Solar Activity: Solar activity has been Moderate over the last 24 hours, with two Moderate-class flares. The largest of these a low class Moderate flare at 13/1015UTC from a large active region near the southwest limb. There are currently ten numbered and two un-numbered regions on the visible disc. Of these the two largest, complex regions are located in the southeast and northeast quadrants, with a further moderately large, complex region in the southwest quadrant. Three regions continue to emerge around the eastern limb.

No new Earth-directed CMEs have been identified on available imagery.

Solar Wind / Geomagnetic Activity: Solar winds were slightly elevated to background levels but increased after 13/1800UTC to reach elevated levels. Density was average to below average level, but also increased to occasionally above average after 13/1800UTC. Magnetic field strength showed a similar trend, increasing from weak to moderate for a time during the UTC evening of 13th. The north-south component was often southward, becoming occasionally moderate in strength later in the UTC day. The above parameters appeared to indicate evidence of passing CME influence. Geomagnetic activity was mainly Quiet (Kp 1-2) but became Unsettled to Active from 13/1800UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at mostly background levels, although showed an enhancement through the 13th but below the S1 level, due to a flare/CME event from just beyond the southwestern limb.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to continue at Moderate levels, with further Moderate-class flares likely and a slight chance of a Strong-class flare.

Solar Wind / Geomagnetic Activity: Suspected glancing interaction with the 9th Jan CME may linger at first into day 1 (14th). A further CME is possible on 15th or 16th January from an eruption on 11 January, potentially giving some glancing interaction, although with very low confidence.

Otherwise, any coronal high speed stream effects will wane, with solar winds gradually returning towards slow-ambient levels. Geomagnetic activity is expected to be mainly Quiet to Unsettled over the next 24 hours, with the chance of further isolated Active intervals at first on day 1 (14th), and perhaps again on day 2 (15th), due to possible CME effects. Mainly Quiet conditions currently expected through days 3 and 4 (16th and 17th).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is likely to remain at predominantly background with a chance of further enhancements

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which could produce an S1 or greater event through the period.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	10	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	80	80	80	80
Very Active	R3 to R5 X	No	15	15	15	15

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	30	30	30	30
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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